AECV90-R3

Description and Operation of the Humane Trapping Research Facility at the Alberta Environmental Centre

CANADIANA
C 2
MAR 26 1991

Alberta
ENVIRONMENTAL CENTRE

Digitized by the Internet Archive
in 2016

https://archive.org/details/descriptionopera00nola_0

DESCRIPTION AND OPERATION OF THE HUMANE TRAPPING RESEARCH FACILITY AT THE ALBERTA ENVIRONMENTAL CENTRE

by

J.W. Nolan and M.W. Barrett

Wildlife Biology Branch

Animal Sciences Division

Alberta Environmental Centre

Vegreville, Alberta

August 15, 1990

This report may be cited as:

Nolan, J.W. and M.W. Barrett. 1990. Description and Operation of the Humane Trapping Research Facility at Alberta Environmental Centre. Alberta Environmental Centre, Vegreville, AB. AECV90-R3. 36 pp.

TABLE OF CONTENTS

Page

TABLE OF CONTENTS ii

LIST OF PHOTOGRAPHS iii

LIST OF FIGURES iv

ACKNOWLEDGEMENTS v

INTRODUCTION 1

1.0 ACCESS SYSTEM AND SERVICES 2

2.0 CORE BUILDING AND STORAGE BUILDING 4

3.0 ANIMAL HOLDING FACILITIES 7

3.1 Small Mammal Holding Pens 7

3.2 Large Mammal Holding Pens 15

4.0 TEST PENS 19

4.1 Small Mammal Test Pens 19

4.2 Large Mammal Test Pens and Runway 22

5.0 ELECTRICAL AND VIDEO SUPPLY SYSTEM 25

6.0 VIDEO OBSERVATION AND RECORDING SYSTEM 28

6.1 Video Camera System 28

6.2 Video Control and Recording System 31

6.3 Video Editing System 32

7.0 SECURITY SYSTEM 33

8.0 SUMMARY OF RESEARCH APPLICATION 34

LITERATURE CITED 35

LIST OF PHOTOGRAPHS

Page

Photo 1. Core Building and Storage Building 4

Photo 2. Raised Pen-Nest Box Unit 10

Photo 3. Double Compartment Nest Box 14

Photo 4. Large Mammal Holding Pen and Runway 19

Photo 5. Elevated Boardwalk Accessing Test Pens 21

Photo 6. Small Mammal Test Pen 21

Photo 7. Large Mammal Test Pen 24

Photo 8. Electrical and Video Conduit System 27

Photo 9. Extended Red Light Camera System 30

Photo 10. Video Control Recording and Editing Console 32

Photo 11. Perimeter Security Fence 33

LIST OF FIGURES

Fig. 1 Humane Trapping Research Facility - General Layout 3

Fig. 2 Floor Plan of Core Building 6

Fig. 3 Mink and Marten Holding Units on Platform 8

Fig. 4 Raccoon and Fisher Holding Units on Platform 9

Fig. 5 Overflow Holding Units on Platform 10

Fig. 6 Mink and Marten Holding Pen and Nest Box 12

Fig. 7 Raccoon and Fisher Holding Pen and Nest Box 13

Fig. 8 Overflow Holding Pen 16

Fig. 9 Large Mammal Holding Pen 17

Fig. 10 Large Mammal Nest Box 18

LIST OF FIGURES (Continued)

Page

Fig. 11 Small Mammal Test Pen 20

Fig. 12 Large Mammal Test Pen and Runway 23

Fig. 13 Electrical and Video Layout 26

Fig. 14 Video Console 29

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the following staff for their assistance and contributions to the development of the Humane Trapping Facility and to this report. J. Barbeau drafted the initial figures in the report. B. Goski researched the video equipment and acted as a contact person and advisor for the video purchases. D. Nelson worked on site during construction and assisted in the supervision of contractors. We also thank the staff of the Alberta Public Works, Supply and Services, Vegreville Shop for their advice and support during the planning and construction of the facility. Alberta Environment's Drafting Section developed the final figures for the report.

We gratefully appreciate the efficient clerical support provided throughout the program by our Animal Sciences Administrative Support staff.

INTRODUCTION

The Humane Trapping Research Program was initiated by the federal and provincial governments to address societal concerns and a changing awareness towards fur trapping in Canada (Barrett et al., 1988). The Fur Institute of Canada (FIC) requested and financially supported the development of a Humane Trapping Research Facility in association with the Alberta Environmental Centre (AEC) in Vegreville. Discussions between FIC and AEC lead to the August, 1984 signing of a five-year cooperative agreement in humane trapping research.

The Fur Institute provided funding for the construction and operation of a major research facility at Vegreville. The Wildlife Biology Branch of AEC was responsible for the research, design and construction of the facility. The facility would be the "outdoor laboratory" for the development and testing of new and modified humane trapping systems for Canadian furbearing animals.

The facility was designed to provide qualitative and quantitative results of animal behavior in relation to potentially humane trap sets. Because no comparable facilities of this type existed as a blueprint, basic research concepts used in the Federal Provincial Committee on Humane Trapping (FPCHT) Program were reviewed to provide initial guidelines (FPCHT Report, 1981). Fur farm facility designs and guidelines of the Canadian Council on Animal Care (1984) were also evaluated as an additional basis on which to develop animal holding facilities for a range of terrestrial furbearing species. Unique, fully vegetated test pens were constructed to accommodate research for large and small species in outdoor, year-round conditions. A custom-designed, remotely controlled, audio visual monitoring and recording system was incorporated in the pens to collect data on animal behavior and trap effectiveness under daylight or night conditions.

1.0 ACCESS SYSTEM AND SERVICES

The research facility was constructed in a naturally wooded area on the southwest corner of the AEC property, approximately 200 m from the county road (Fig. 1). The research compound is accessed by a 3-m wide clay base all-weather gravelled lane, controlled by the locked gates off the county road, and a locked double swing gate at the security fence which surrounds the facility. Sidewalks and lanes inside the facility were surfaced with asphalt. Small mammal holding and test pens are accessed by a raised boardwalk constructed of preservative-treated lumber.

Access to the core building includes three pedestrian doors and one overhead vehicle door. Several large sliding windows permit ample natural light and the option of fresh air circulation.

Electric power is delivered to the core building by overhead lines; telephone is supplied by underground service. Propane drawn from a 4500-L storage tank heats the core building. Water is supplied

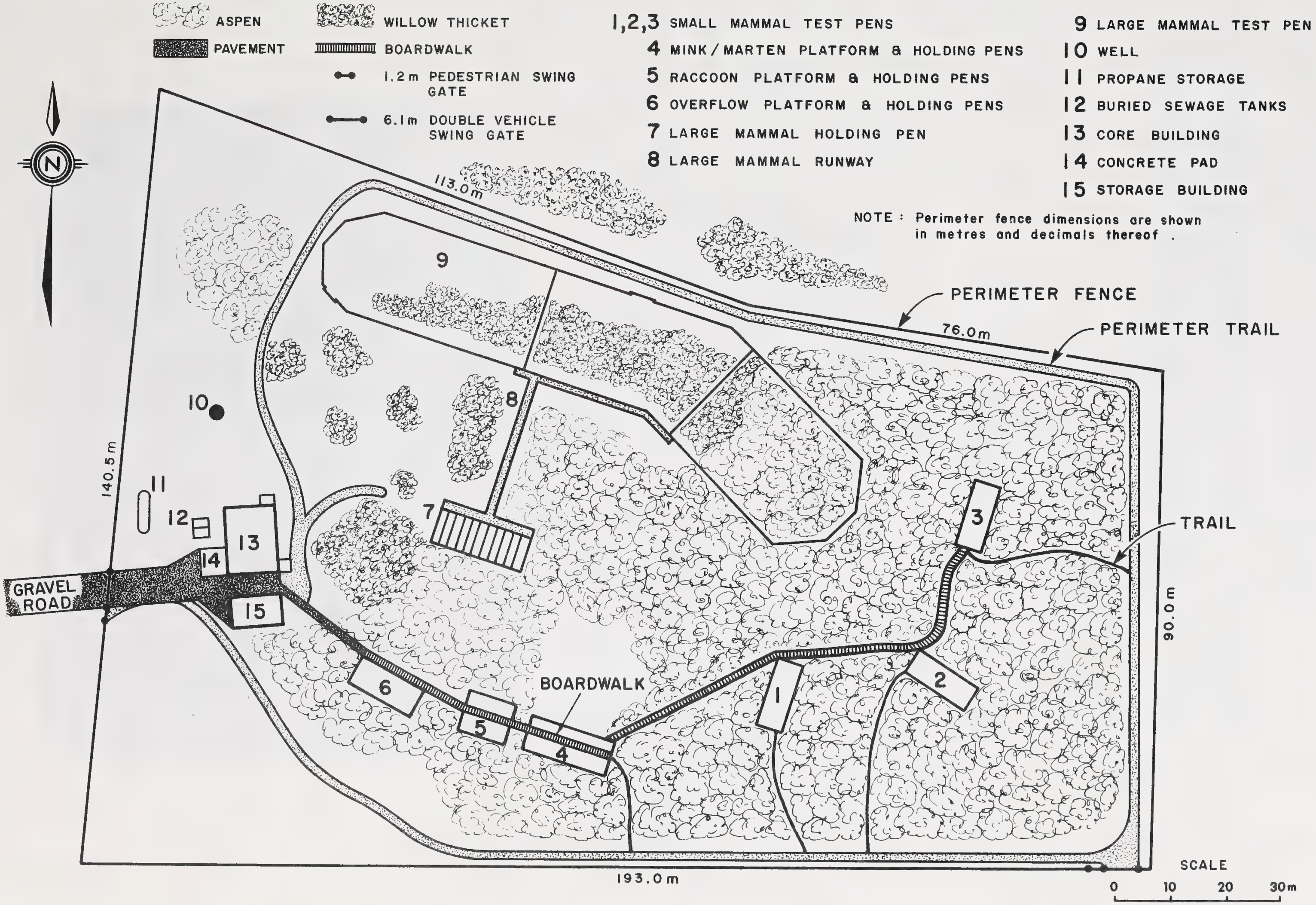


FIG. 1. HUMANE TRAPPING RESEARCH FACILITY – GENERAL LAYOUT

by an underground well located in the compound. Toilet and sink waste water is deposited in two separate 4500-L underground sewage holding tanks.

2.0 CORE BUILDING AND STORAGE BUILDING

The core building is designed and constructed as the operational base of the facility and serves many functions (Photo 1). The 111-m^2 insulated metal building (Butler Landmark II, Butler Building Systems, Burlington, ON), built on a reinforced concrete floor, is fully serviced. The building is heated by a propane furnace with a forced-air under-slab ducting system. A pressure hot and cold water

PHOTO 1. CORE BUILDING AND STORAGE BUILDING

system is also built under slab and supplies a bathroom with shower, a lab sink, and two outdoor and two indoor tap sets. Floor wash down is facilitated by the centrally located two-compartment floor sump drain.

Electrical outlets are located throughout the core building with covered outdoor receptacles placed in the wash down area. Several outdoor outlets are located on the exterior walls of the core building including a 220-volt outlet to supply power to a portable walk-in freezer unit.

The core building contains operational work and service areas required to conduct daily maintenance of animals and research activities at the facility (Fig. 2). The mechanical room contains the furnace, water pressure system, hot water heater and electrical service panel. Trap modification, maintenance and storage are carried out in the mechanical bench area. Animal health examinations and preselection tests are conducted on a large stainless steel examination table located in the wash down section located in the central area of the core building. The utility room contains a sink and lab bench used primarily for feed preparation and general storage of husbandry supplies. The video room is an enclosed locked section of the core building; it contains the video console and equipment and serves as an office.

The storage building is a 56-m^2 uninsulated building (Butler Landmark II) constructed on concrete, with electrical power service (Photo 1). The building has one pedestrian and one overhead vehicle door. A large walk-in freezer for frozen food storage is located in

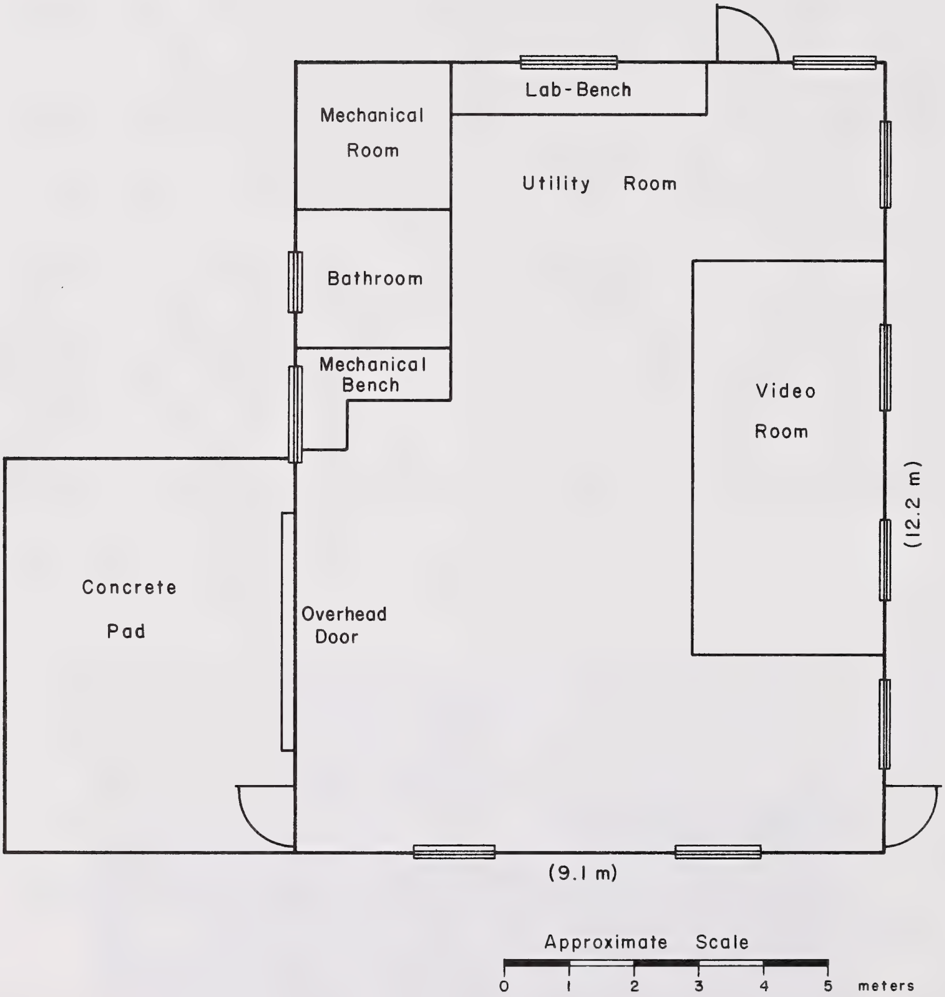


FIG. 2. FLOOR PLAN OF CORE BUILDING

the corner. The remaining area is designated for equipment and supplies storage on wall shelf units. The core and storage buildings were constructed by Vantage Builders Ltd., Vegreville, AB.

3.0 ANIMAL HOLDING FACILITIES

To take advantage of the natural habitat, holding pens were located in aspen (Populus tremuloides) habitat on three individual wood platforms (Fig. 1). Platforms are elevated and levelled on preserved timber blocking. A raised boardwalk, 1.5 m wide, leads from the core and storage buildings to the holding facilities.

All animal holding facilities are equipped with flood lights and electrical and video outlets.

3.1 Small Mammal Holding Pens

Two platforms are used to support raised pen-nest box units for mink-marten (Mustela vison, Martes americana) size and raccoon-fisher (Procyon lotor, Martes pennanti) size furbearers. Twenty-eight mink-marten units (Fig. 3) and 14 raccoon-fisher pens (Fig. 4) are located on individual platforms. A 20-compartment dog-kennel style pen used as overflow holding for raccoon, fisher or red or arctic fox (Vulpes vulpes, Alopex lagopus), is permanently fixed on a wooden platform (Fig. 5).

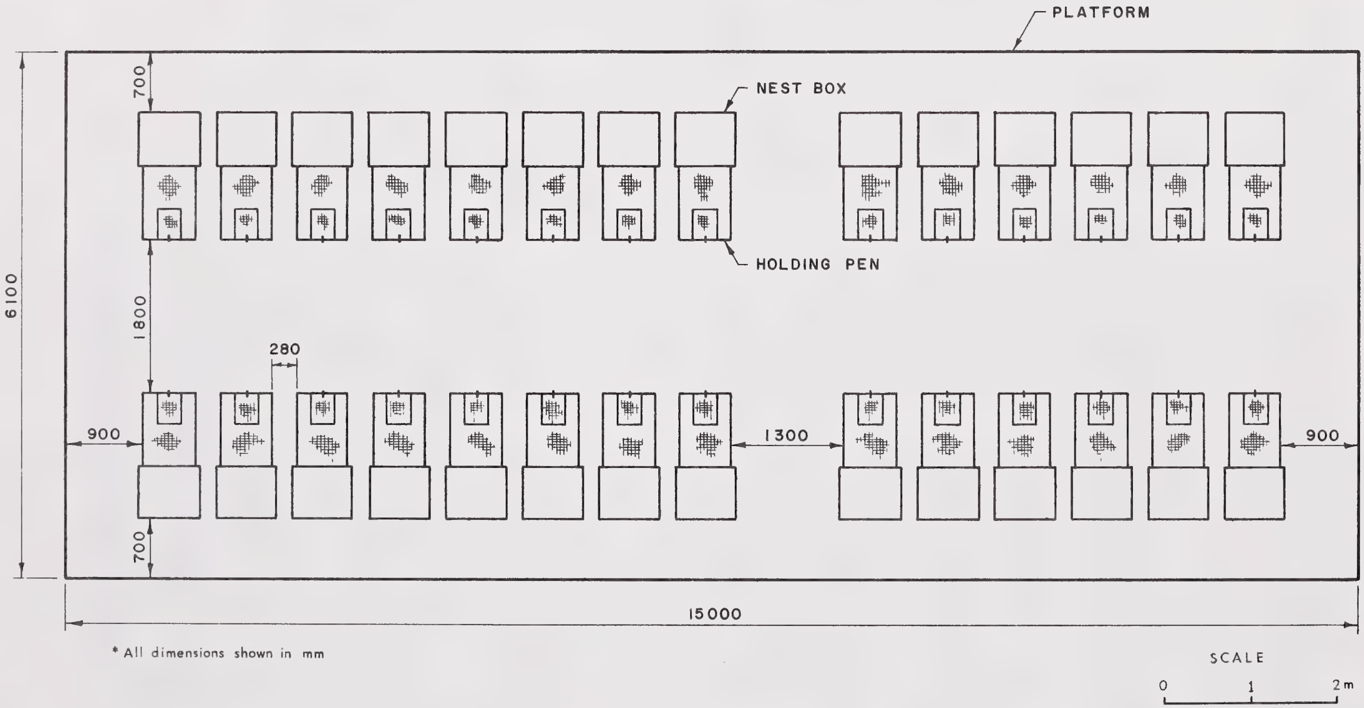


FIG. 3. MINK AND MARTEN HOLDING UNITS ON PLATFORM

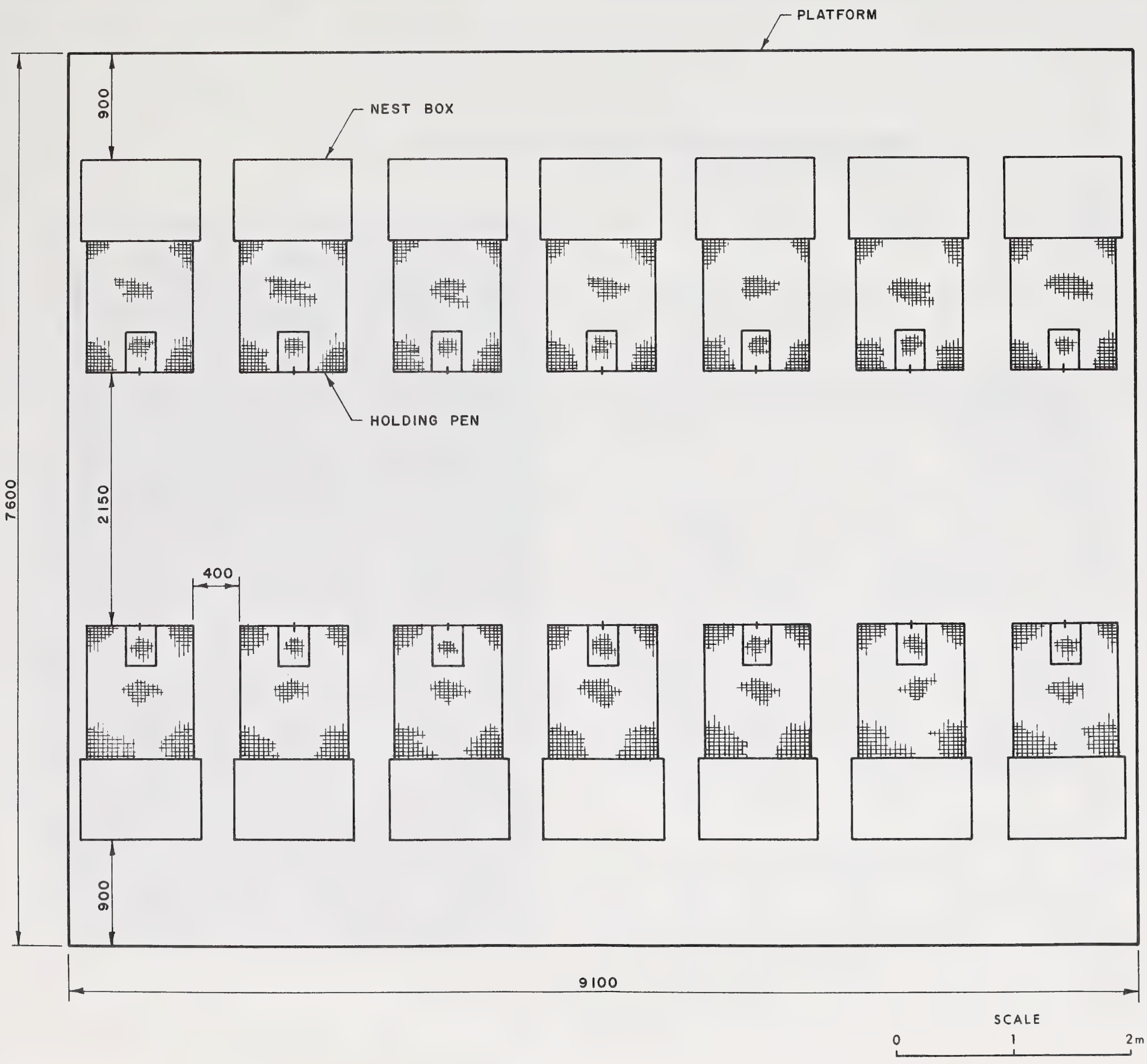


FIG. 4. RACCOON AND FISHER HOLDING UNITS ON PLATFORM

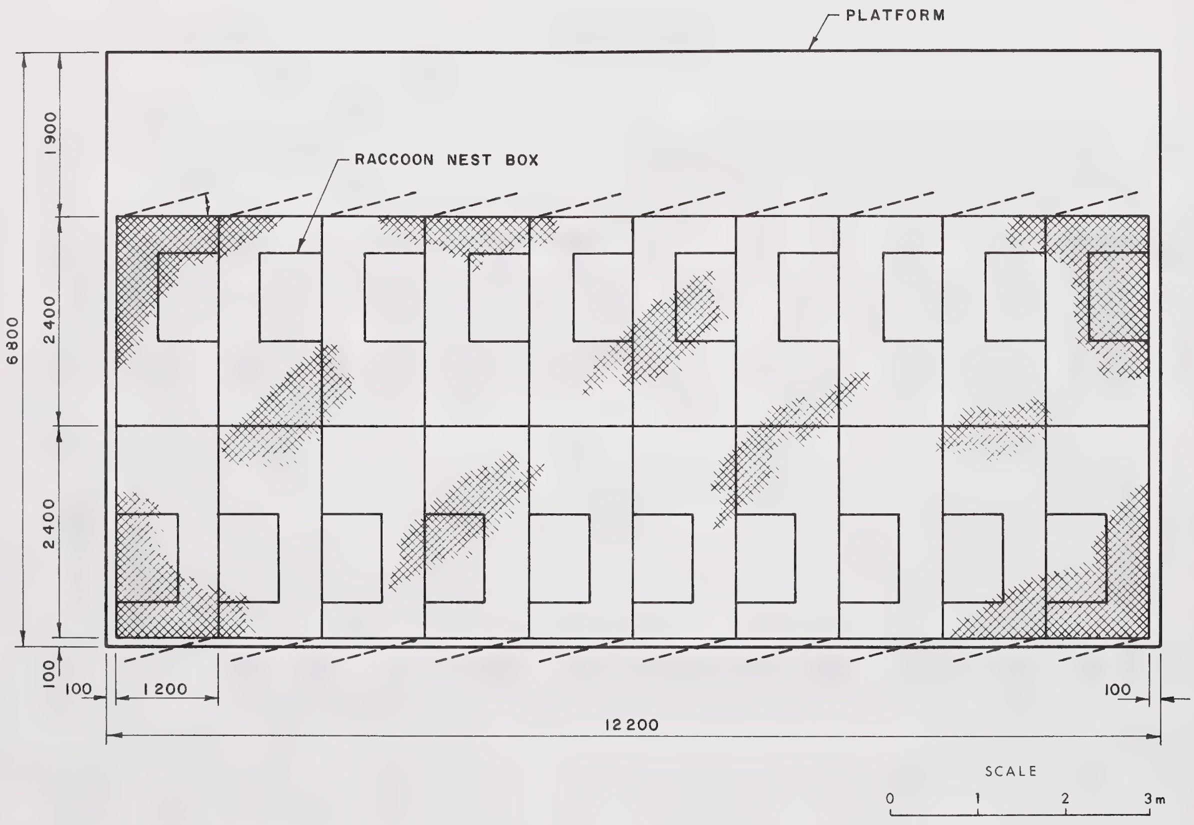


FIG. 5. OVERFLOW HOLDING UNITS ON PLATFORM

Raised pen-nest box units are set on elevated galvanized frame stands (Photo 2). Pens are constructed of 25 x 25 mm, 14 gauge, galvanized after welding (GAW) weld mesh wire. Mink-marten pens measure 60x45x90 cm, substantially larger than the dimensions recommended in the Canadian Council of Animal Care Guidelines (Fig. 6). Raccoon pens are approximately 2.8 times larger by volume than mink pens and constructed of the same material (Fig. 7). A hinged reinforced wire door, used when feeding, is located on the front center section of the pen roof. The door is held in place by a spring wire catch with a chain snap as a backup to prevent animal escapes. A cut-out section in the lower back corner of the pen allows

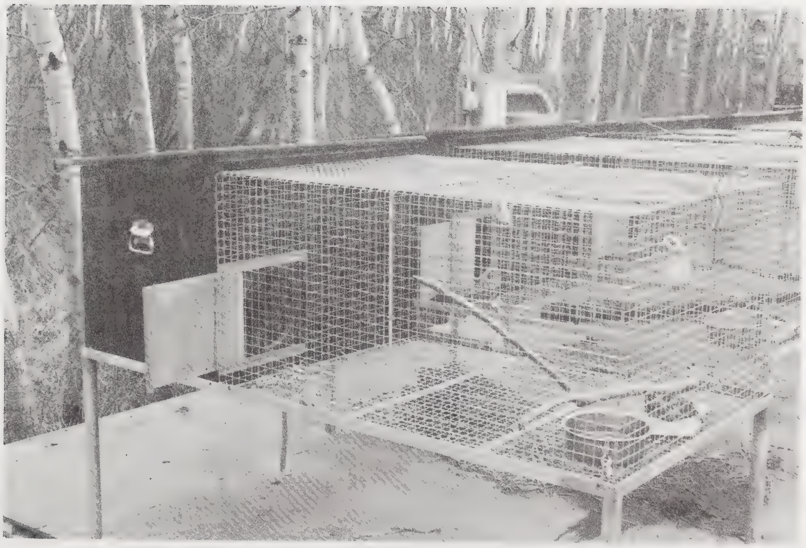


PHOTO 2. RAISED PEN–NEST BOX UNIT

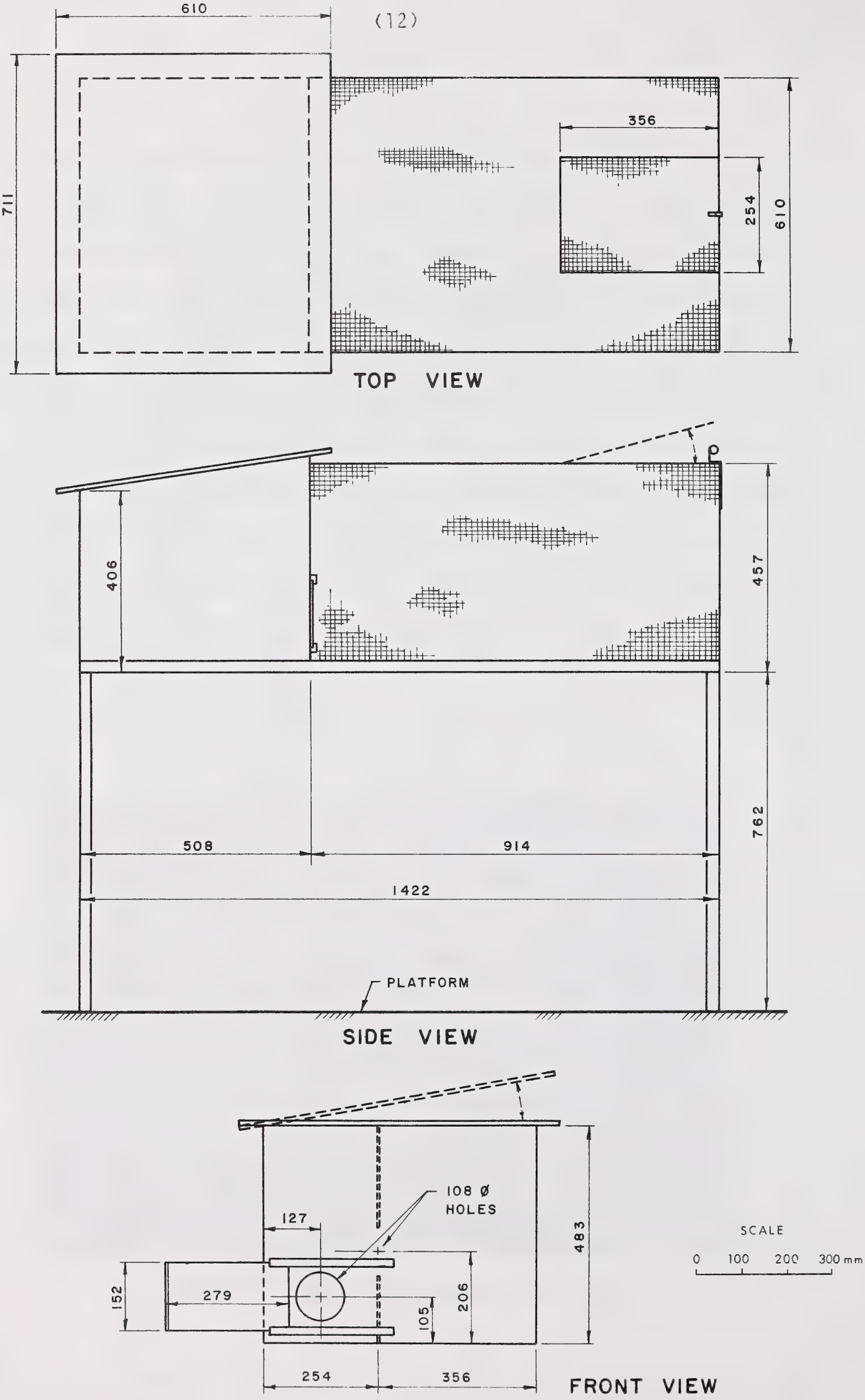
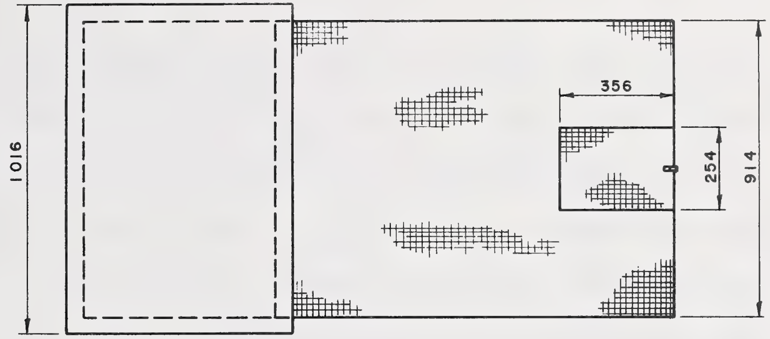
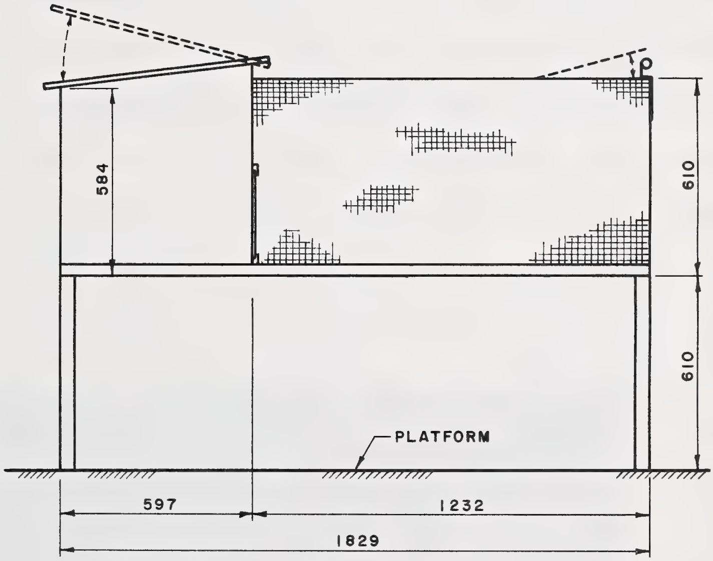


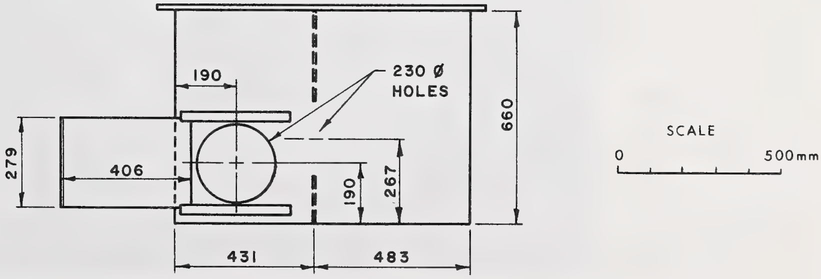
FIG. 6. MINK AND MARTEN HOLDING PEN AND NEST BOX



TOP VIEW



SIDE VIEW



FRONT VIEW

FIG. 7. RACCOON AND FISHER HOLDING PEN AND NEST BOX

access to the two-compartment nest boxes attached directly to the pen on the frame stand. Nest boxes, constructed of 19 mm plywood (Photo 3), are built in a small size for mink or marten and a larger size for raccoon or fisher (Fig. 7). The animal entrance door of the nest box is aligned with the hole in the pen; access is regulated by a horizontal sliding metal door. The interior door, positioned in the divider wall, leads to the sleeping or bedding compartment. The two-room design offers seclusion to the animal and reduces drafts in adverse weather. The hinged roof of the nest box swings open in an upward ark, permitting full access to both sections. A removable wire mesh cover rests on brackets under the roof permitting viewing or

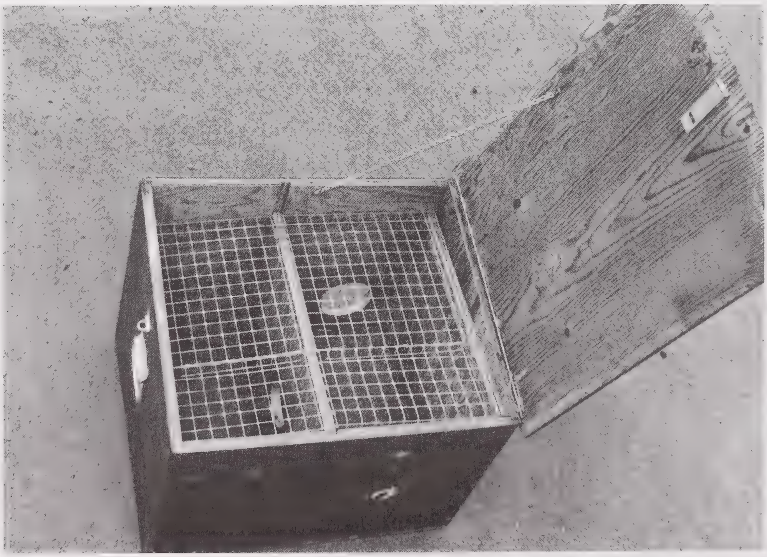


PHOTO 3. DOUBLE COMPARTMENT NEST BOX

handling of the animal when the roof is in the raised position. Transfer of animals to a test pen is accommodated by confining the animal in his nest box and moving the nest box and animal.

The overflow pen, located on platform 6, was used to house surplus animals on a temporary basis. The pen was constructed of 5-cm, 9-gauge chain link mesh (GAW) (Fig. 8). The roof is enclosed by chain link sections and the floor is covered with 19-mm plywood panels. A swing gate is located at each end of each pen. A standard two-compartment nest box with a sliding metal door is placed on the floor of each pen unit.

3.2 Large Mammal Holding Pen

The large mammal holding pen, a ten-compartment dog-kennel style system constructed on a concrete pad (Fig. 1), is designed to house canids and felids (Photo 4). The system is built of 5-cm, 9-gauge chain link mesh (GAW). Each compartment has a swing gate at both ends, with the front gate entering an enclosed alleyway leading to the runway system (Fig. 9). By manipulating specific gates a selected animal can be directed from its holding pen, through the alley and runway into any specified large mammal test pen. A larger two-compartment nest box, similar to the small mammal nest box, is placed in each pen (Fig. 10). The outside pens on either end of the series of pens, have sheet metal panelling replacing the lower wire section. These solid panels visually screen and reduce exposure to the animals occupying the outside units.

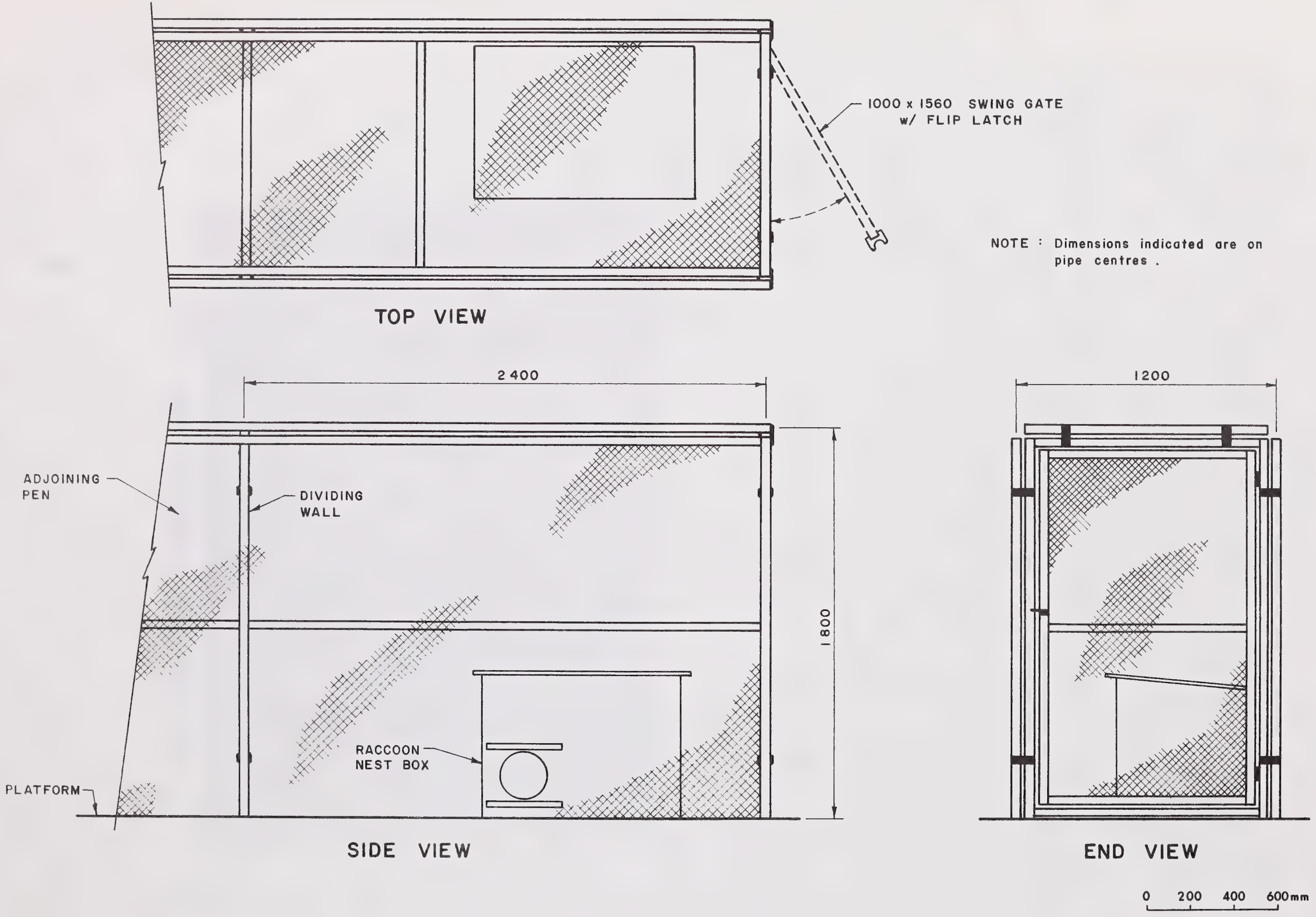


FIG. 8. OVERFLOW HOLDING PEN

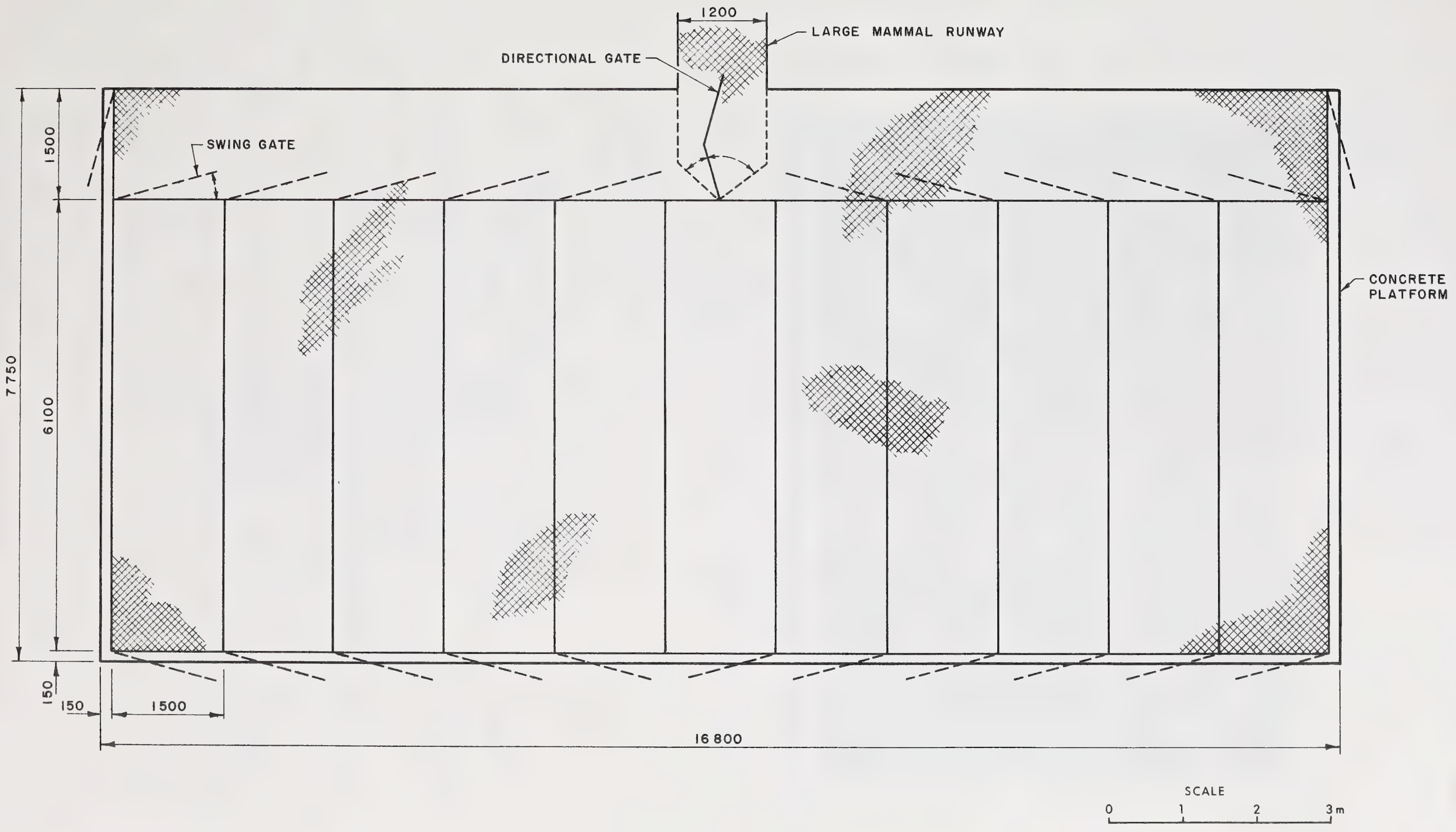


FIG. 9. LARGE MAMMAL HOLDING PEN

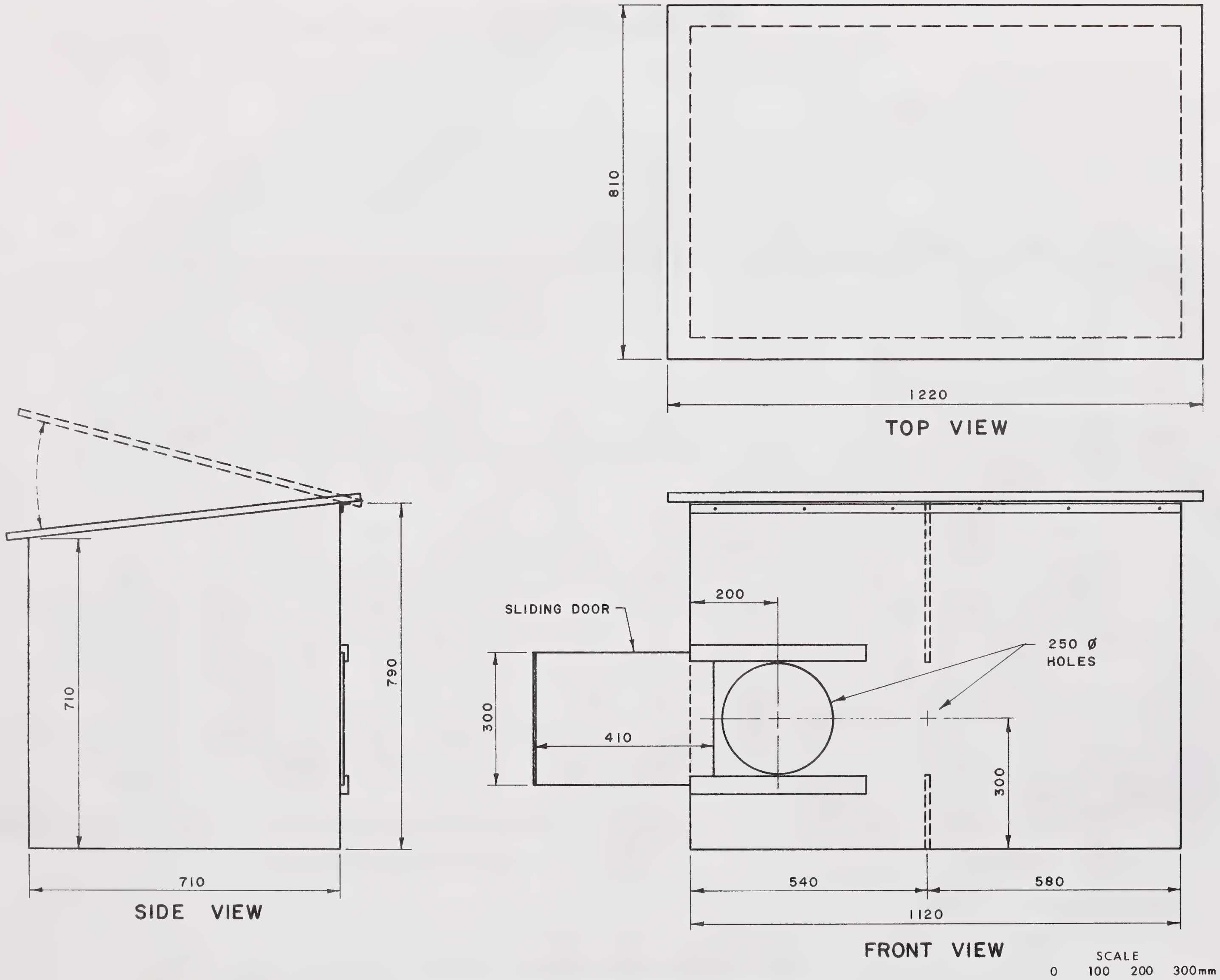


FIG. 10. LARGE MAMMAL NEST BOX

PHOTO 4. LARGE MAMMAL HOLDING PEN AND RUNWAY

4. TEST PENS

4.1 Small Mammal Test Pens

Three small mammal test pens are strategically spaced in the mature aspen sites of the enclosure (Fig. 1, 11). Elevated boardwalks provide pedestrian access from the test pens to holding facilities and the core building (Photo 5). A concrete level-grade beam supports and anchors the frame and wire structure of the test pen (Photo 6). A 1.22-m subterranean reinforced wall, 15 cm thick, is part of the grade-beam structure. This buried wall serves as an underground

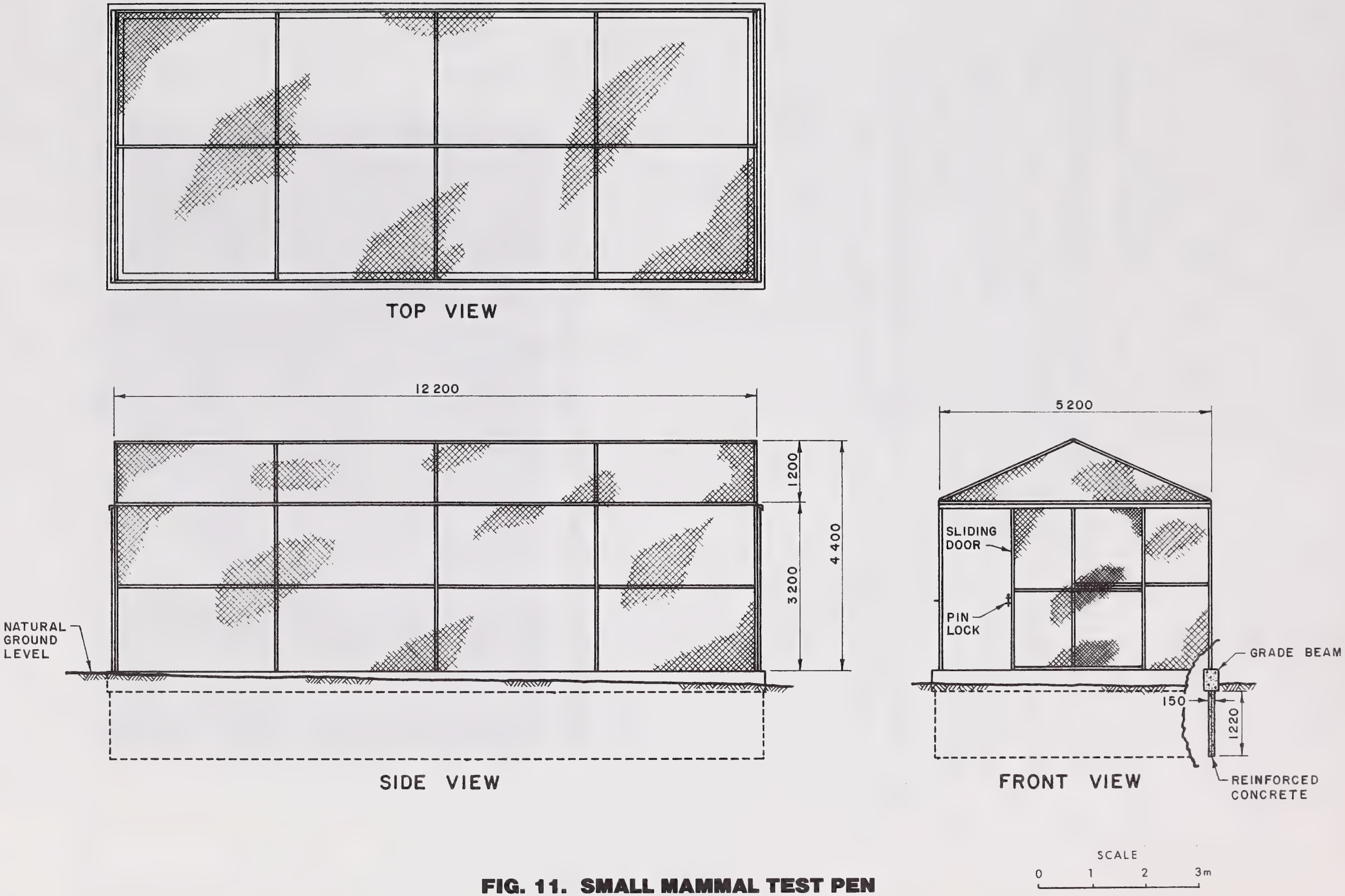


FIG. 11. SMALL MAMMAL TEST PEN

PHOTO 5. ELEVATED BOARDWALK ACCESSING TEST PENS

PHOTO 6. SMALL MAMMAL TEST PEN

barrier preventing animals from digging under the grade beam and escaping. Fine-mesh, custom-made, 1.5-cm, 14-gauge chain link material covers the walls and roof. Gap tolerances on gates, joints and grade beam interfaces are less than 1.5 cm. These minimum construction tolerances allow the pen to be used for species as small as red squirrels (Tamiasciurus hudsonicus). Large sliding doors are located at both ends of the test pen to permit access by mechanized landscaping and tree planting equipment. Care was taken during construction to minimize the removal or damage of trees, shrubs and ground cover within and adjacent to the pens. Most trees inside the pens were topped just below the roof level to retain a near-natural forest setting. In two pens a large tree was permitted to go through an opening in the wire mesh roof. A custom-made flexible wire cone enveloped the tree stem and was fixed to the opening making the modification escape proof for climbing species of furbearers.

4.2 Large Mammal Test Pen and Runway

The large mammal test pen is a three-part enclosure, 1960 m^2 in area encompassing three distinct habitats (Photo 7). Mature aspen forest dominate the east section with a transition to dense willow (Salix spp.) in the center enclosure, then changing to a mixed shrub, grassland habitat in the west section of the complex (Fig. 12). Each section is roughly one-third of the total area, however, by opening or closing pairs of gates in the two dividing walls, all three sections can be used separately or as one large unit. The diversity of habitat

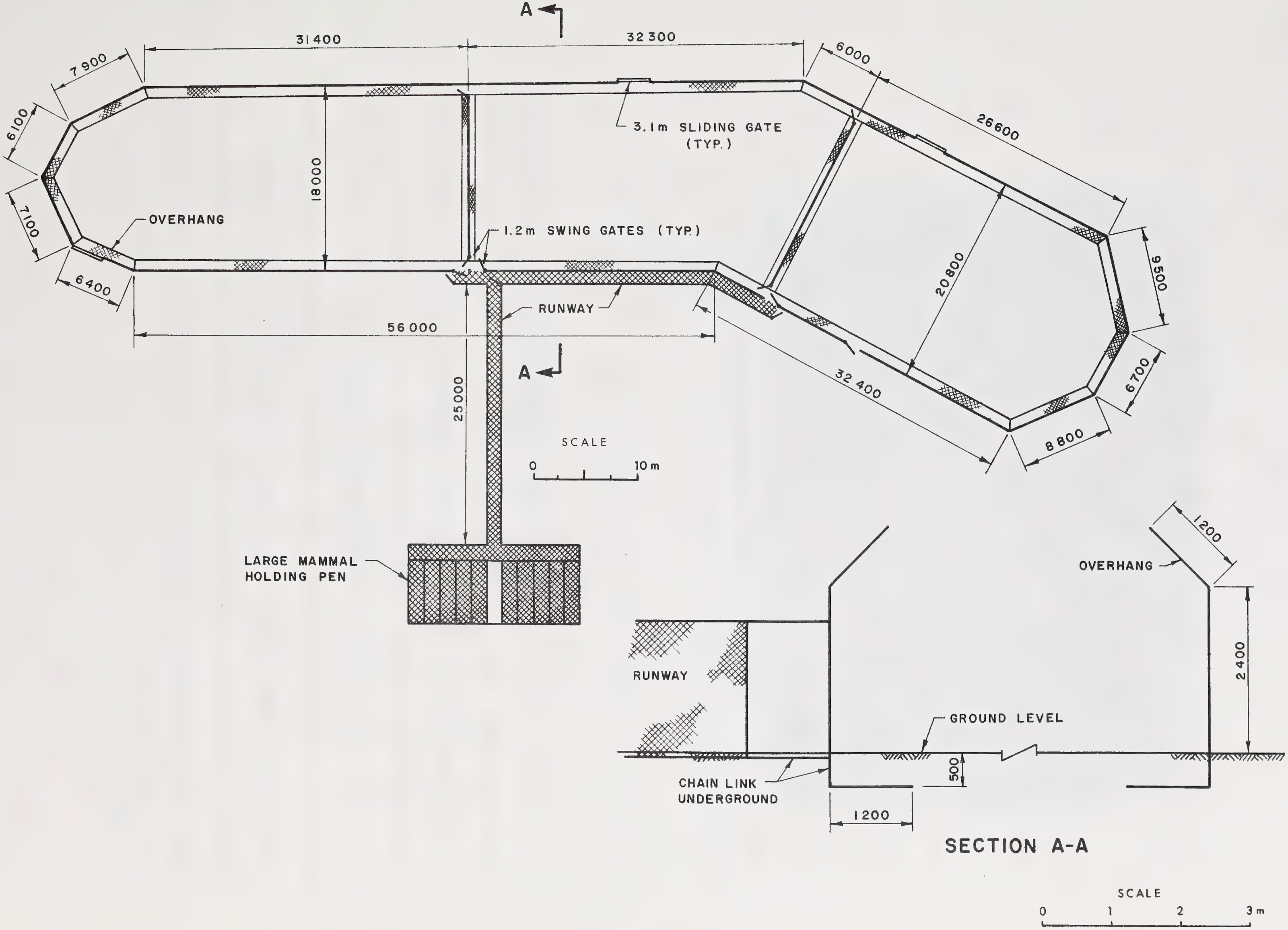


FIG. 12. LARGE MAMMAL TEST PEN AND RUNWAY

PHOTO 7. LARGE MAMMAL TEST PEN

within the large test pen was conducive to making a wide range of trap testing sets for large furbearers.

Exterior and divider walls are constructed of 5-cm, 9-gauge chain link mesh (GAW). The outside fence wall is 2.9 m in height and 0.5 m buried below ground. A buried 1.2-m horizontal chain link mesh apron is attached to the inside base of the exterior fence and buried 30 cm deep to prevent canines from digging under the fence. A 1.2-m, 45° inward overhang section is attached to the top rail preventing animals from climbing over the top. Three sliding vehicle gates are located in the large test pen to permit access for tree planting and landscaping equipment. Research staff can access the pens through three pedestrian gates. Care was taken during the construction of the facility to minimize damage to trees and shrubs in and near pens. All excavated areas have been reseeded.

The runway system is a totally enclosed alleyway constructed of 5-cm, 9-gauge chain link mesh (GAW) connecting the large mammal holding facility with the test pens. The runway follows a direct line of 25 m to the test pen, then parallels the accessing gates in the outside fence to each of the three sections. The floor was underlain with wire mesh and revegetated to grass. Holding pens and test pen facilities were designed and constructed by Soldan Fence and Metals Ltd., Edmonton, AB. Platforms for holding pens, concrete grade beams and boardwalk system were designed and constructed by Vantage Builders Ltd., Vegreville, AB.

5.0 ELECTRICAL AND VIDEO SUPPLY SYSTEM

The electrical and video supply system, delivered in twin polyvinylchloride and electric metallic tube conduits, services four animal holding areas and seven test pen units (Fig. 13). Lines are buried between the core building and holding facilities and between the holding facilities and the individual small mammal test pens. Above ground, the conduits are fastened to the underside of the boardwalks and platforms and on the horizontal piping of the chain link pens and fences (Photo 8). Each of the four holding facilities

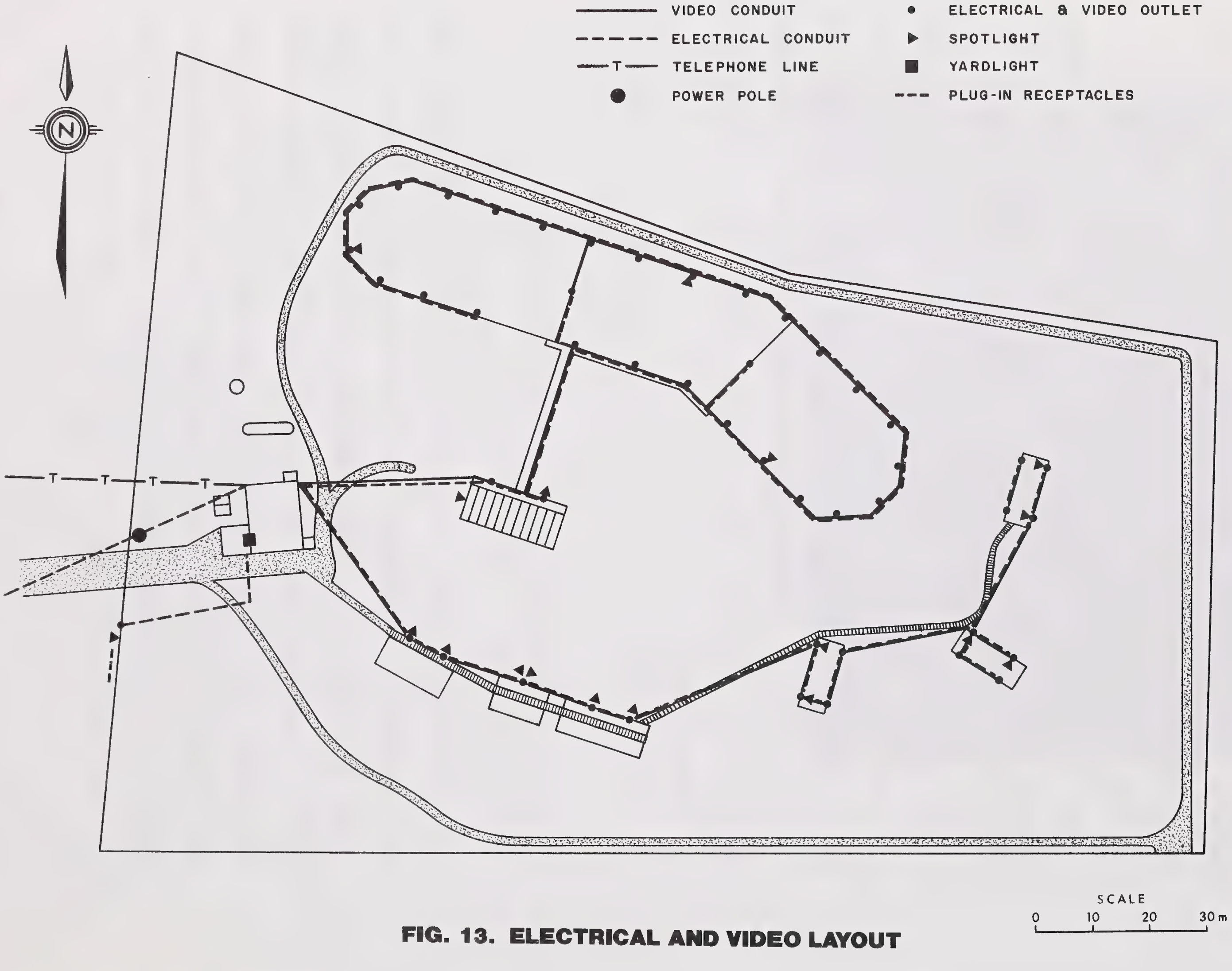


FIG. 13. ELECTRICAL AND VIDEO LAYOUT

PHOTO 8. ELECTRICAL AND VIDEO CONDUIT SYSTEM

has two lights and two independent pairs of video and electrical outlets. Video and electrical outlets are placed in outdoor junction boxes and are secured to fence, pen or platform structures at chest height.

The small mammal test pens have a light at each gate and four pairs of video and electrical outlets in each pen. The large mammal test pen has a light at each gate and video and electrical outlets spaced every 9 m along the outer and divider fences.

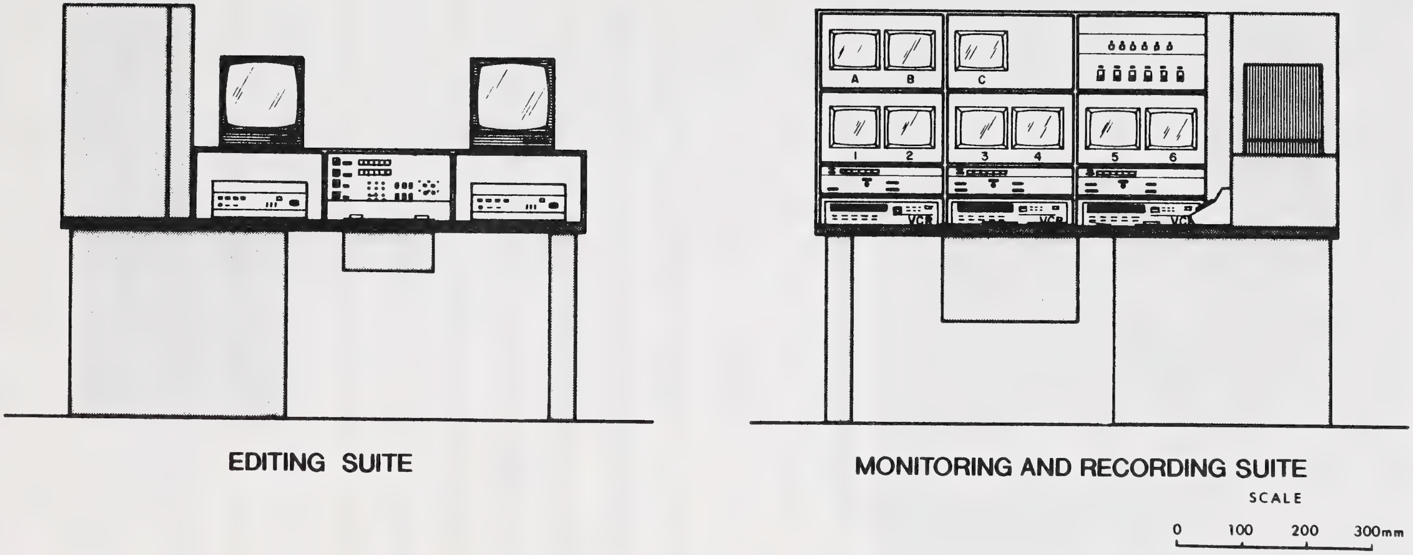
Lights and power circuits to the outdoor holding and test facilities are controlled from an independent panel box located in the core building. All video circuits including camera controls and audio cables originate from the video room in the core building.

6.0 VIDEO OBSERVATION AND RECORDING SYSTEM

The video system is a collection of electronic and video components, custom designed to remotely monitor and record events of animal behavior and trap performance. Most of the equipment was manufactured by Panasonic in the 1/2" video format. Control of the system, observations and recording of events in outdoor pens are all carried out from the video console within the confines of the core building (Fig. 14).

6.1 Video Camera System

Four Panasonic, high resolution black and white cameras (Model WV1854) with an extended red light viewing component were selected. Cameras incorporated the Panasonic Newvicom video tube which reaches peak efficiency at the infrared range of about 800 nanometers (nm). Each camera unit is fitted with a 15 to 180 mm, F1.9 zoom lens (Cosmicar Model 1500) and mounted in an environmentally controlled housing suited for year-round outdoor use (Photo 9). The housing units are equipped with heater, window defrost and window wiper. A heavy-duty outdoor pan/tilt mechanism is used to control camera/housing movement. During extremely cold weather a quilted electric warming blanket is wrapped around the pan/tilt mechanism to reduce cold-induced stiffening of moving parts.



EDITING SUITE

MONITORING AND RECORDING SUITE

FIG. 14. VIDEO CONSOLE

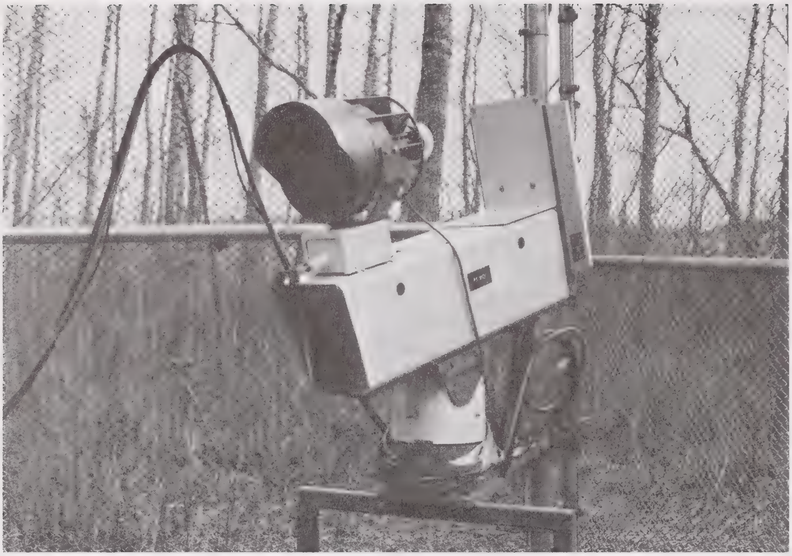


PHOTO 9. EXTENDED RED LIGHT CAMERA SYSTEM

The fully portable camera system may be set up near (<10 m) any of the video/power outlets located throughout the facility.

A high-efficiency 500-watt infrared flood light with auto-photo on/off switch is fitted on top of the camera housing. During night viewing, the infrared flood illuminates the viewing area with light in the wavelength of about 790 nm. That wavelength matches the maximum efficiency of the extended red video tube (800 nm) in the camera system resulting in clear, fully lighted images. The human eye cannot see light at wavelengths longer than 760 nm (Technical Notes, Avicom Industrial Communications, 1989). No evidence of test animals reacting to the infrared flood lights was noted over hundreds of hours of observations. The camera also operates effectively in normal daylight conditions.

The complete camera unit including housing, light, and pan/tilt mechanism,weighing over 50 kg, is mounted on either a sturdy free-standing quadpod or a fence-mounted bipod (Avicom Industrial Communications Ltd., Edmonton, AB, designed and installed the video system).

6.2 Video Control and Recording System

All video control and recording is initiated from a compact custom-built video console that can be operated by one person (Photo 10). Camera functions including power, pan/tilt, defroster, wiper, zoom, focus and iris are remotely controlled from the console. Activating one of six passive circuit switches will place the selected camera in control mode. A "joy stick" and specific control switches will operate and control the selected cameras. Six, independent 23-cm black and white monitors are dedicated to the six video circuits.

A second set of five passive switches control camera output to any or all of five VHS video recorders. Three recorders with a special time lapse feature can record at normal mode, 24-hour mode or 72-hour mode on a single tape. Each of the time lapse recorders has a dedicated 23-cm black and white play back monitor. All recorders have a time/date generator option which allows permanent labelling of activities and events on individual tapes.

PHOTO 10. VIDEO CONTROL RECORDING AND EDITING CONSOLE

Two motion detector units can be assigned to any of the six video monitors during animal tests. If movement is detected on a preselected section of the monitor screen, an audio signal is emitted, warning the researcher of an animal approach. The motion detector system can also be employed to activate video recorders.

6.3 Video Editing System

A high-quality 1/2" VHS video editing system is built into the video console. The system includes two editing recorders, two 33 cm color monitors and a control panel. An image writer unit is interfaced to the editing system and incorporates a variety of titles and labels to finished tapes. The system has a full range of editing, copying, and labelling features.

7.0 SECURITY SYSTEM

Security at the facility serves two functions: 1) to prevent intrusion of vandals wishing to disrupt humane trapping research and 2) to prevent or reduce the chance of an escaped research animal from leaving the facility.

A 2.4-m high security fence built of 5-cm, 9-gauge chain link mesh (GAW) and extending to 0.5 m below ground was constructed around the perimeter of the facility (Photo 11). An outward overhang, fitted

PHOTO 11. PERIMETER SECURITY FENCE

with a 0.5-m, three-strand barbed wire was fixed to the top rail. Two sets of gates, a vehicle and pedestrian gate were located at the main access entrance and at the southeast corner of the facility. A row of white spruce, approximately 2 to 3 m high was planted along the south side of the perimeter fence in an effort to establish a visual barrier from the county road. The security fence was constructed by Soldan Fence and Metals Ltd., Edmonton, AB.

A two-level electronic detection and alarm system protects the outdoor facilities and the core building. The system was designed, operated and maintained by the Alberta Department of Public Works. The security system details are confidential.

8.0 SUMMARY OF RESEARCH APPLICATION

The majority of research conducted at the humane trapping facility concerned the evaluation of traps for a given species of furbearer. Animal behavior in relation to traps and trap sets can be accurately monitored at the facility which leads to the evaluation of trap efficiency and effectiveness. A series of progressive tests are carried out at the humane trapping research facility beginning with acclimation trials, approach testing, preselection testing, kill testing and performance confirmation (Barrett et al., 1988; Proulx and Barrett, 1989). Traps that pass this series of testing are then subject to controlled field testing on a trapline (Barrett et al., 1989).

To date research has involved killing traps for marten, mink, raccoon and fisher (Proulx *et al.*, 1989; Proulx and Barrett, 1989, 1990; Proulx *et al.*, 1990). Three models of power neck snares were tested with red fox in the confines of the facility (Proulx and Barrett, 1990). Additional work continues on traps for arctic fox, long-tailed weasel (*Mustela frenata*) and restraining devices for raccoons. Traps that pass the test procedure are expected to meet any national or international standards for traps.

LITERATURE CITED

Barrett, M.W., G. Proulx, and N. Jotham. 1988. Wild Fur Industry Under Challenge: The Canadian Response. Trans. 53rd N.A. Wildl. & Nat. Res. Conf. 53:180-190.

Barrett, M.W., G. Proulx, D. Hobson, D. Nelson, and J.W. Nolan. 1989. Field evaluation of the C120 Magnum trap for marten. Wildl. Soc. Bull. 17:299-306.

Canadian Council on Animal Care. 1984. Guide to the Care and Use of Experimental Animals. Volume 2. Ottawa, ON. 208 pp.

Federal Provincial Committee for Humane Trapping. 1981. Final Report. Comm. of the Fed. Prov. Wildl. Conf., Ottawa, ON. 172 pp.

Proulx, G., and M.W. Barrett. 1989. On the development and implications of the Conibear 120 Magnum trap to harvest marten and mink. Proc. N.E. Fur Resources Tech. Committee Mtg., Sept. 7-9, 1988. Beauport, PQ. pp. 193-209.

Proulx, G., M.W. Barrett, and S.R. Cook. 1989. The rotating-jaw C120 Magnum trap: an effective device to kill marten. Wildl. Soc. Bull. 17:294-298.

Proulx, G., and M.W. Barrett. 1990. Assessment of power snares to effectively kill red fox. Wildl. Soc. Bull. 18:27-30.

Proulx, G., M.W. Barrett, and S.R. Cook. 1990. The rotating-jaw C120 Magnum trap equipped with a pan trigger: an effective device to kill mink (*Mustela vison*). J. Wildl. Disease. (In press.)

N.L.C. - B.N.C.
3 3286 10458753 6